

III. NEOTROPICAL HOMOPTERA OF THE CARNEGIE MUSEUM.

PART 6. REPORT ON THE SUBFAMILY TYPHLOCYBINÆ, WITH DESCRIPTIONS OF NEW SPECIES.

(PLATES XIII-XVI)

BY HERBERT OSBORN.

This group includes a considerable number of very delicate and fragile species, the study of which has been somewhat neglected. The collection before me embraces a large number of apparently undescribed species, which cover a considerable range of the interior of Brazil, the upper Amazons, Bolivia, and Colombia.

On account of the extreme fragility of the specimens it becomes difficult to determine in every case the complete details of structure, especially as many of the specimens appear to have been collected at light, and to have had the wings more or less singed or damaged at the tips, or in other cases broken off because of their extreme delicacy. Since these parts are of special importance in the separation of species and since many of the species are represented by but one or few specimens, it is easy to appreciate that the determination in some cases must be uncertain.

Probably many of these species have a distinct economic importance, as they doubtless occur in great abundance on certain food-plants; and, as their habits must be similar to those of forms occurring in temperate regions, we may expect them to cause very distinct damage to the plants infested by them.

Some of them have a very wide range of distribution, occurring throughout all parts of the tropics and in some cases being recognized as of economic importance. However, for many of the species noted here we have with present records a very limited range. The tropical species have been described by Stål, Berg, Gillette (1900) Baker (1899-1903), Van Duzee, and McAtee (1926). The larger number are covered in two papers by Baker and the recent publication of McAtee.

Since the Collection of the Carnegie Museum includes a large pro-

portion of the known species from the neotropics, and as I have a number of others in my collection, and have been able to examine most of the others, it has been thought worth while to include references to most of the known species, and so this article may serve in some degree as a review of the neotropic species of the group. It is hoped that it may lead to a better knowledge of these fascinating insects.

Order **HEMIPTERA** Linnæus.

SUBORDER *HOMOPTERA* Latreille.

Family *CICADELLIDÆ* Latreille.

SUBFAMILY *TYPHLOCYBINÆ* Distant.

KEY TO THE GENERA OF *TYPHLOCYBINÆ* IN THE AMERICAS.

1. Elytra with an appendix..... 2
Elytra without an appendix..... 3
2. Wing with distinct marginal vein; ocelli present *Alebra*
Wing without distinct marginal vein..... *Protalebra*
3. Wing with submarginal vein..... 4
Wing without submarginal vein..... 9
4. Ocelli present..... 5
Ocelli wanting..... 7
5. Elytra with bent veins forming short and broad anteapical cells
or reticulations,..... *Parallaxis*
Elytra with long veins not bent 6
6. With one apical cell in wing..... *Empoasca*
With one cell and branch of vein forming partial cell.... *Joruma*
7. With three apical cells in wing..... *Eualebra*
With two apical cells in wing..... 8
8. Second apical cell of elytra not stalked..... *Dikraneura*
Second apical cell of elytra stalked..... *Alconeura*
9. Elytra angulate, one apical cell in wing..... *Typhlocybella*
Elytra not angulate, two or three apical cells..... 10
10. With three apical cells in wing..... *Eupteryx*
With two apical cells in wing..... 11
11. Second apical cell of elytra triangular and pedicellate. *Typhlocyba*
Second apical cell of elytra elongate, with broad base not pedi-
cellate..... *Erythroneura*

Genus *ALEBRA* Fieber.

Alebra FIEBER, Katalog der Europäischen Cicadinen, 1872, p. 14.

1. *Alebra fulvomaculata* n. sp. (Pl. XIII, figs. 1, 1a.)

Head short and broad, distinctly wider than pronotum; eyes conspicuous. Vertex scarcely longer at middle than next the eye, rounded to front. Front long, tapering to base of clypeus; loræ narrow. Pronotum over twice as long as vertex, hind border nearly truncate. Male with last ventral segment elongate, twice as long at middle as preceding, with a shallow notch on hind margin; plates small, triangular, margin ciliate, tip acute, reaching tip of pygofer.

Color pale yellow. Two large curved spots on vertex; V-shaped mark on base of front. Three large oval spots on pronotum, basal angle and apex of scutellum, two large transverse spots on middle of clavus, a smaller spot at base and apex, a spot at base and two oblique spots on corium and narrow band on cross-veins, bright orange. Below pale yellow, feet whitish. Length, 3.25 mm.

One male specimen (holotype), Provincia del Sara, Bolivia, Feb., 1913. Carn. Mus. Acc. No. 5064 (Steinbach coll.).

2. *Alebra decorata*, n. sp.

Head broad, as wide as pronotum. Vertex as long as width between the eyes, convex, bluntly conical. Pronotum one-fourth longer than vertex, slightly concave behind. Elytra broad. Female with last ventral segment long, three times as long as preceding, hind border with a broad median tooth. Male with last ventral segment slightly longer than preceding, plates broad at base, convex, acute, contracted to short, acute, upturned tips, lying between two prominent tufts of brown bristles.

Color pale yellow, with broad anterior border of pronotum, orange-red. Elytra with two broad orange-red splashes from near base to an oblique hyaline band, which crosses the outer third of clavus. An orange band near tip of clavus extends obliquely to the costa at transverse veins; apical cells hyaline, broadly fuscous on transverse veins. Abdomen above dusky, beneath pale yellow. Legs pale yellow, tips of hind tibiæ and tarsi dusky. Length, 3 mm.

Described from two females and five males from Los Amates, Guatemala, Feb. 1905 (J. S. Hine). This species is evidently quite closely related to Baker's *sanguinolinea*, but distinctly different in the picture on the elytra. Type, allotype, and paratypes in Ohio State University Collection. Paratype in Carnegie Museum and Collection of Herbert Osborn.

3. ***Alebra terminalis*** Osborn. (Pl. XIII, figs. 2, 2a).

Alebra terminalis OSBORN, Annals Carn. Mus., Vol. XV, 1924, p. 451.

The figure given will serve to amplify the description published in an earlier part of this series of papers.

4. ***Alebra pictifrons*** n. sp.

Broad, robust; head wider than pronotum; eyes large; vertex rounded, scarcely longer at middle than next the eye; front broad at base, narrowed below antennæ; clypeus large, somewhat swollen at base; pronotum one-half longer than vertex, rather deeply concave. Last ventral segment of male large, rounded behind, covering base of plates; plates small, broad at base, narrowing rather abruptly into acute, upturned tips, reaching nearly to tip of pygofer.

Ornately pictured with yellow and orange-red, two large round black spots on the border between vertex and front; ivory-white spots on the scutellum; elytra hyaline; veins whitish; membrane tinged with yellow; tergal segments black, bordered with yellowish; beneath, front with a broad central white stripe, bordered with orange-red; cheeks yellowish; legs dull yellowish, venter brownish, with the segments margined with yellow; last ventral segment, pale yellow, becoming whitish hyaline at tip. Length, 3 mm.

One male (holotype) Provincia del Sara, Bolivia, Nov. 1912 (Steinbach), Carn. Mus. Acc. No. 5064. This is a very beautifully pictured species, especially marked with two black spots at base of front. The venation is indistinct, but the general facies seems to place it in *Alebra*.

Genus **PROTALEBRA** Baker.

Protalebra BAKER, Psyche, Vol. VIII, 1899, p. 403.

5. ***Protalebra fulveola*** n. sp. (Pl. XIII, figs. 3, 3a.)

Head as wide as pronotum, obtusely angulate; vertex little longer at middle than next the eye. Pronotum twice as long as vertex. Last ventral segment of male slightly longer than preceding; valve very short; plates broad at base, contracted behind the middle, outer margin sinuate; tips narrow, acute, upturned, reaching tip of pygofer.

Uniformly fulvous with lateral borders of vertex and anterior lateral border of pronotum a little more whitish. A distinct white dot at middle of anterior border and one at each posterior angle. Beneath whitish; abdomen pale yellow. Length, 3 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Dec. 1912. Carn. Mus. Acc. No. 5064.

6. *Protalebra clitellaria* n. sp. (Pl. XIII, figs. 4, 4a).

Head almost as wide as pronotum, obtusely angulate; eyes brown; vertex half longer at middle than next the eye; pronotum half longer than vertex, emarginate behind; last ventral segment of male longer than preceding, slightly concave; valve minute, triangular; plates broad, two-thirds of basal area with convex margin, apical part spoon-shaped, slightly divergent, tips rounded, extending two-thirds distance to tip of pygofer.

Light yellow, tinged with orange, especially on disk of vertex, pronotum, and disk of elytra. Two large fuscous spots on the posterior margin; scutellum fuscous; clavus chocolate-brown at base, with fuscous dots on basal angle; margin of clavus and posterior border forming a roundish brown dorsal spot, or saddle, with eight black spots on its margin. Beyond tip of clavus the membrane is somewhat smoky. Beneath yellowish white. Length, 3 mm.

One male specimen (holotype) Chapada, Brazil, Nov., Acc No. 2966 (H. H. Smith *coll.*). The tips of elytra and wings are damaged, but the species apparently belongs in this genus.

7. *Protalebra lineatella* n. sp.

Head scarcely as wide as pronotum, distinctly angulate; vertex produced, half longer at middle than at eye. Pronotum one-third longer than vertex, concave behind. Elytra long, narrowing apically. Last ventral segment of female twice as long as preceding, rounded behind.

Ivory-white; disk of vertex and pronotum tinged with fulvous; elytra ivory-white to tips, clavus with delicate lines from base of scutellum with two delicate lines starting at base of scutellum and extending along near margin of clavus beyond the middle, fairly divergent and terminating in an oblique cross-band, which runs from tip of clavus to before middle of costa. Another delicate blackish line partly follows the claval suture, and then bends to merge with inner line at its termination. Behind the oblique cross-line is a bright fulvous patch with two oblique extensions to costa. Apex black, edged with white. Beneath ivory-white; tips of hind tibiae and hind tarsi, a few spines on tibiae, and margin of pygofer, blackish. Length, 3 mm.

One female (holotype) Santa Lucia, Guatemala, Feb. 2, 1905. In Collection of Ohio State University (Hine *coll.*). A very handsome little species with very distinctive color picture.

8. *Protalebra eburneola* n. sp. (Pl. XIII, figs. 5, 5a; 6, 6a).

Head scarcely as wide as pronotum, distinctly angulate; vertex about one-half longer at middle than next the eye. Pronotum a half

longer than the vertex, emarginate behind; elytra narrow, margins nearly parallel. Last ventral segment of male as long as preceding; plates broad at base, contracted a little before the middle, tips narrow, upturned, extending beyond tip of pygofer.

Ivory-white; elytra tinged with fulvous, a little darker on the apex, with milky hyaline spots on the cross-nervure and in first and second areoles. Beneath whitish or ivory-white; abdomen a little more tinged with yellow, tarsal claws dusky. Length, 3 mm.

Three males (holotype and paratypes) Provincia del Sara, Bolivia, (Steinbach), Feb., 1913. Carn. Mus. Acc. No. 5064.

9. **Protalebra robusta** (Gillette). (Pl. XIII, figs. 7, 7a).

Alebra robusta GILLETTE, Proc. U. S. National Museum, Vol. XX, 1898, p. 712.

Head rather broad, robust, and about as wide as pronotum; vertex narrow, as long as width between the eyes, slightly produced; front rather broad, tapering to clypeus. Pronotum slightly longer than vertex, faintly sinuate behind. Elytra broad, apical cells rather short. Last ventral segment of male one-half longer than preceding, hind border slightly convex; plates broad at base, contracted behind the middle, tips upturned.

Pale yellow; vertex with three large spots, one at apex and one on each side between the eyes. Pronotum with four orange stripes. Elytra dark fuscous with yellowish stripes and whitish tips; costa bordered with a series of broad, reddish spots; clavus with an oblique, pale spot; apical cells smoky with a few hyaline spots. Abdomen above, fuscous, except at tip. Face, sternum, and legs, whitish. Abdomen beneath pale yellow; tips of plates fuscous. Length, 3.25 mm.

One specimen, Provincia del Sara, Bolivia (J. Steinbach). Carn. Mus. Acc. No. 5064. Gillette's description was based on a single male specimen, taken at Chapada, Brazil (H. H. Smith *coll.*).

10. **Protalebra vexillifera** Baker. (Pl. XIII, figs. 8, 8a).

Protalebra vexillifera BAKER, Psyche, Vol. VIII, 1899, p. 404.

Head as wide as pronotum. Vertex rather narrow, as long as width between the eyes, sub-angulate, convex. Pronotum one-third longer than vertex, hind border slightly concave. Elytra broad at middle. Last ventral segment of male slightly longer than preceding, plates narrow, elongate, triangular, tips acute, margins finely ciliate.

Pale yellow or whitish; vertex, base of pronotum, and a broad curved band on elytra, ivory-white. A large spot on front border of pronotum with a transverse band behind, and the scutellum, orange; margin of pronotum, propleura, and base of costa, sanguineous; the

broad curved band is margined before and behind with fuscous, and across the commissure with red; apical cells hyaline, bordered with fuscous. Length, 3.5 mm.

Two specimens, Provincia del Sara, Bolivia (J. Steinbach), Carn. Mus. Acc. No. 5064. One specimen, Provincia del Sara, Bolivia, 450 M. (J. Steinbach), Nov. 1909. Baker's description was based on specimens from Chapada, Brazil (H. H. Smith *coll.*, Apr.).

11. *Protalebra bicincta* n. sp.

Head scarcely as wide as pronotum, somewhat produced, scarcely angulate; vertex one-half longer at middle than at eye. Pronotum nearly twice as long as vertex. Last ventral segment of female nearly twice as long as preceding, faintly sinuate.

Ivory-white; eyes tinged with red; pronotum in type specimen with a glistening fulvous spot on disk, faint in paratype; a reddish brown spot on lateral margin. Pronotum with a narrow dark margin; elytra subhyaline, basal and middle third whitish, suffused with yellow; a double band across middle of clavus and a single band of fuscous at tip of clavus, dark fuscous; scutellum, border of clavus, and apical veins, infusate. Two large antapical spaces milky hyaline. Beneath ivory-white, ovipositor tinged with reddish. Length, 3 mm.

Two female specimens (holotype and paratype) in Osborn Collection, Rio Piedras, Porto Rico, Oct. 22, 1924, attacking oaks, "robles" from Dr. H. L. Dosier.

12. *Protalebra sabana*, n. sp.

Head as wide as pronotum, produced, bluntly angular; vertex narrow, longer at middle than width at base; ocelli distinct, but colorous. Pronotum as long as vertex. Elytra long, fourth apical cell broader at base. Last segment of female long, produced, and narrowed behind, extreme tip truncate or faintly concave.

Ivory-white, anterior and lateral border of pronotum, propleura, an elongate curved spot on clavus, basal dot, oblique broken spot on disk of corium and another oblique spot before cross-veins and the ovipositor, orange-yellow; apical cells hyaline, a large dot at end of inner discal cell, the borders of central discal cell, an oblique dash on costal cross-vein, and apical part of first apical cell fuscous, or smoky; last ventral segment yellow. Length 3 mm.

Described from two females (holotype and paratype) collected by the writer at Los Sabanas, Panama, May 9th, 1927, from woody shrub at border of thicket.

13. **Protalebra aureovittata** (DELONG).

Alebra aureovittata DELONG, Jour. Dept. Agric. Porto Rico, Vol. VII, 1923, No. 1, p. 267.

Alebra aureovittata MCATEE, Jour. N. Y. Ent. Soc., Vol. XXXIV, 1926, p. 153.

Vertex produced, longer than head, angulate; ocelli concolorous; pronotum wider than head, longer than vertex, deeply concave behind. Last segment of female longer than preceding, lateral angles rounded, middle slightly produced or angled. Last ventral segment of male long, valve wanting, or hidden; plates long, tapering to slender tips. Pygofer in both sexes with numerous white setæ, and on each side near the middle two coarse black bristles.

Pale yellow or whitish; two broad stripes on the pronotum, the commissure, and a claval stripe, golden yellow; a double dot at end of clavus, faint oblique bar on costa, and a large dot at base of central apical cell, black, or dark fuscous. Length 3 mm.

Described originally from Porto Rico. The writer collected a single male at Los Sabanas, Panama, May 9th, 1927, while sweeping shrubby growths at border of thicket. It agrees with the type material, which has been in hand for comparison.

14. **Protalebra pallida**, n. sp.

A slender delicate species. Head scarcely as wide as pronotum, distinctly angulate. Vertex about one half longer at middle than next the eye. Pronotum scarcely longer than vertex, hind border deeply emarginate. Last ventral segment of female twice as long as preceding, hind border faintly sinuate, middle lobe a little produced; pygofer with bristles on apical half. Last ventral segment of male as long as preceding; plates narrow, contracted at middle, tips slender, upturned, and fringed with delicate cilia.

Pale ivory-white. Two stripes on the pronotum, extended across the scutellum, converging on internal margin of clavus, and a stripe bordering the claval suture, pale honey-yellow. A black cloud at tip of clavus, a distinct fuscous spot in base of third apical cell, and dusky margins on the apical cells. Beneath whitish, two bristles on each side of pygofer, an apical bristle on tibia, and the tarsal claws, black. Length, 3 mm.

Described from one female (holotype) and one male (allotype), from San Sebastian, Porto Rico, Oct. 17, 1924 (H. L. Dosier coll.).

15. **Protalebra terminata** Baker. (Pl. XIII, figs. 9, 9a; 12, 12a).

Protalebra terminata BAKER, Psyche, Vol. VIII, 1899, p. 404.

Slender, head narrower than pronotum. Vertex narrow at base, not as wide as length at middle. Pronotum slightly longer than

vertex; elytra narrow. Last ventral segment of male one-half longer than preceding; plates narrow, contracted beyond middle, tips slender, acute, margined with long cilia.

Pale yellow. Disk of vertex and disk of pronotum, with short orange stripes; elytra with four transverse orange zigzag lines. Apical cells fuscous with hyaline spots. Length, 3 mm.

Three males, Provincia del Sara, Bolivia (J. Steinbach), Dec. 1911. Carn. Mus. Acc. No. 5064. Originally described from Chapada, Brazil.

16. **Protalebra cubana** Osborn.

Protalebra cubana OSBORN, Ann. Ent. Soc. Am., Vol. XIX, 1926, p. 350.

"Evidently similar to *P. terminata* Baker, but smaller and the color pattern different. Head as wide as pronotum, distinctly produced, broadly rounded and slightly conical, face elongate, border of cheeks nearly straight. Pronotum about one-fourth longer than vertex. Last ventral segment of male as long as preceding, truncate, valve wanting, plates elongate, tumid at base, slightly separated at middle, tips converging, bluntly pointed.

Light yellow, vertex and face almost white; pronotum with two broad, oblique, orange stripes near outer margin; elytra with golden spots at base, center, and apex of clavus, and on disc of corium; veins beyond clavus yellow, bordered with fuscous; the areoles hyaline with a broad, smoky patch at apex, margined with white; beneath pale yellow; legs whitish; plates with a black spot at center. Length, 2.5 mm."

"Described from one specimen collected at Hershey, Cuba, March 18th, 1925. This must be closely related to *P. terminata*, but is much smaller and the color pattern differs in some important respects from my specimens of Baker's Brazilian species."

17. **Protalebra braziliensis** Baker. (Pl. XIII, figs. 10, 10a; 13, 13a).

Protalebra braziliensis BAKER, Psyche, Vol. VIII, 1899, p. 405; VAN DUZEE, Catalog Hemipt. 1917, p. 698.

Head as wide as pronotum, somewhat produced, sub-angulate, face narrow. Pronotum slightly wider than vertex; scutellum large; elytra broad at the middle, costa distinctly curved. Last ventral segment of female as long as preceding, truncate. Last visible segment of male equal to preceding, valve hidden, plates wide at base, separate at middle, narrowing to acute tips, as long as pygofer.

Light yellow with hind border of vertex, most of pronotum, scutellum, inner border at base of clavus, a broad band across middle of corium and apex beyond transverse veins, dark fuscous; base and a

broad area beyond the middle band and apex of clavus, yellow, or yellowish white, sometimes nearly clear; spots near tip of clavus and in the antapical areoles hyaline; beneath bright yellow, tips of tarsi dusky. Length, 3 mm.

A common species in tropical America. Specimens in the Carnegie Museum collection from Chapada, Taperina, and Santarem, Brazil, Acc. No. 2966 (H. H. Smith); Bonfim, Bahia, Nov. 1907, Acc. No. 3420 (Haseman); Provincia del Sara, Bolivia, 450 M. (J. Steinbach); and Bonda, Colombia, June, Acc. No. 1999 (H. H. Smith). I have also seen numerous specimens from Guatemala, Panama, Cuba, Barbados, Florida, and other tropical localities. This is one of the commonest and most abundant species of tropical and sub-tropical America.

18. **Protalebra unipuncta**, Baker. (Pl. XIII, figs. 11, 11a).

Protalebra unipuncta BAKER, Psyche, Vol. VIII, 1899, p. 404.

Narrow, slender; head narrower than pronotum. Vertex produced, about as long as width between the eyes; front narrow. Pronotum one-half longer than vertex. Elytra narrow. Last ventral segment of female long, twice as long as preceding, rounded behind, minutely notched at tip.

Pale yellow; vertex with a large black spot at tip; pronotum with two large, diverging spots on posterior disk, and a smaller spot at each side; scutellum orange, with brown tip and basal angles; elytra golden olive with light fuscous spots on clavus. An oblique bar on corium, a whitish hyaline transverse band just behind middle of clavus; veins beyond the middle, golden yellow; costa broadly hyaline; beneath pale yellow; tips of tarsi fuscous. Length, 3 mm.

Three female specimens, Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith) November. Baker's description was based on specimens from Chapada collected by H. H. Smith in January.

19. **Protalebra transversalis** Baker.

Protalebra transversalis BAKER, Invertebrata Pacifica, Vol. I, 1903, p. 6.

Head nearly as wide as pronotum, obtusely angulate. Vertex longer than width at base. Pronotum one-third longer than vertex. Elytra moderately broad. Last ventral segment of female rather long, produced at middle into a broad tooth, margined with black.

Pale yellow; vertex a golden yellow; pronotum tinged with golden; scutellum brown, apex blackish; elytra whitish hyaline, with a broad brown band, margined with fuscous across the middle of clavus;

apical cells fuscous with a sub-marginal band with two spots next the transverse veins, hyaline. Length, 3 mm.

Specimens from Los Amates, Guatemala, Feb. 25, 1905 (J. S. Hine) in Collection of Ohio State University. A specimen also has been placed in the Carnegie Museum. Baker's description was based on specimens from Acapulco, Mexico.

20. ***Protalebra octolineata*** Baker.

Protalebra octolineata BAKER, Invertebrata Pacifica, Vol. I, 1903, p. 7.

Head scarcely as wide as pronotum. Vertex short, width at base greater than length at middle. Pronotum nearly twice as long as vertex. Last ventral segment of female rather short, truncate, median third narrowly bordered with black.

Golden yellow; pronotum with three dusky stripes; elytra with four stripes, the outer ones converging and meeting in front of transverse veins; apical cells hyaline, conspicuous fuscous spot in the outer and inner areoles; beneath dull yellowish; tips of tarsi dusky. Length, 3 mm.

One female, in the Collection of Ohio State University, Los Amates, Guatemala, Feb. 1905 (J. S. Hine.)

21. ***Protalebra lineola*** n. sp.

Head as wide as pronotum, obtusely angulate; vertex about one-fourth longer at middle than at eye; pronotum one-third longer than vertex. Last ventral segment of female truncate. Last ventral segment of male short, one-half longer than preceding; plates broad at base, narrowing behind middle to slender acute upturned tips, extending beyond tip of pygofer.

Golden yellow, pronotum, especially at sides, tinged with olive; elytra with four longitudinal lines terminating at a cross-band at middle; behind these is a transverse whitish hyaline band followed by a subapical line enclosing two clear spaces, the outer apical vein broadly fuscous; apical cells smoky at tip. Beneath whitish. Length, female 3 mm.; male 2.75 mm.

Three specimens, one female (holotype), two males (allotype and paratype) Los Amates, Guatemala, Feb. 25, 1905. In Collection of Ohio State University (J. S. Hine, coll.).

22. ***Protalebra similis*** Baker.

Protalebra similis BAKER, Psyche, Vol. VIII, 1899, p. 403.

Head scarcely as wide as pronotum. Vertex rather flat, produced, sub-angulate, as long as width between the eyes, margin obtusely

angulate; face polished; loræ and cheeks elongate, narrow. Pronotum slightly longer than vertex. Last ventral segment of male scarcely as long as preceding, hind border faintly sinuate; valve wanting; plates convex, elongate, triangular, tips blunt, slightly upturned.

Vertex dark orange, with a white sub-margin, and a black band on the border between the eyes, below which is a white band; the rest of the face, except tip of clypeus, jet-black. Pronotum dull orange, with a conspicuous submarginal black band; scutellum brown; elytra olive-green with black stripes on basal part; a black lunate band at middle of clavus and black stripes followed by a transparent band, beyond which the clavus is black. Corium with two black stripes; a black costal patch; apical cells with a large hyaline patch on the submargin; beneath black. Last ventral segment and apical cells of plates tawny; legs white, the hind pair with fuscous patches on femur and tibia. Length, 2.5 mm.

Redescribed from specimens collected by the author at Ermita, Cuba, Feb. 17, 1925. Specimens from Los Amates and Santa Lucia, Guatemala, and Vega Baja, Porto Rico, in author's collection. Specimens will also be placed in the Carnegie Museum, so that this species may be there represented.

23. **Protalebra maculata** Baker. (Pl. XIII, figs. 14, 14a, 14b).

Protalebra maculata BAKER, Invertebrata Pacifica, Vol. I, 1903, pp. 6-7.

Protalebra pardalis MCATEE, Jour. N. Y. Ent. Soc. Vol. 34, 1926, p. 151.

Head scarcely as wide as pronotum, distinctly produced, almost tumid. Vertex nearly as long as width between the eyes, front long, tapering uniformly to base of clypeus; cheeks elongate, scarcely sinuate along the margin. Pronotum about two-thirds longer than vertex, hind border slightly sinuate. Last ventral segment of male longer than preceding, hind border very thin, almost truncate; valve wanting or hidden; plates elongate, triangular, with narrow tips extending beyond tip of pygofer. Last ventral segment of female narrowed and subangulate.

Black with large conspicuous yellow spots on vertex, pronotum, and elytra, leaving a black band across middle of elytra; apical part of elytra with three hyaline spots in the cells; the veins yellow, margined with fuscous; beneath, face yellow, legs yellowish white; abdomen black, except apex of last ventral segment, which is yellowish; tips of plates dull yellowish. Length, 2 mm.

This very handsome little species redescribed from a single male specimen collected by the writer at Rancho B., Preston, Cuba, Feb. 20, 1925, is represented in the Carnegie Museum by a good series of specimens from Bonda, Colombia, Acc. No. 1999 (H. H. Smith coll.). June and July, 1898.

24. *Protalebra picea* n. sp. (Pl. XIII, figs. 15, 15a).

Head as wide as pronotum, eyes very large. Vertex narrow, width at base less than length at middle, rounded before and broadly rounded to front; front narrow. Pronotum one-half longer than vertex, highly polished; elytra narrow, long; appendix narrow. Last ventral segment of female scarcely longer than preceding, hind border truncate.

Dark piceous, vertex brownish, with fuscous areas on each side, including a whitish dot. Front yellowish, base fading to whitish at clypeus. Pronotum and scutellum pitchy black; elytra deep fuscous with jet-black bars crossing three white spots, two on clavus and one on costa; apical cells dusky, a rounded hyaline spot at base of inner areole; triangular hyaline spot at base of outer areole and a small triangular hyaline spot before middle of costa; beneath pale yellow, the fore tibiae and tarsi and the tips of hind tibiae and tarsi, blackish. Length, 3 mm.

Described from one female specimen (holotype) from Forto Principe, Rio Guaporé, Brazil, Aug. 20, 1909, Carn. Mus. Acc. No. 4043 (Hase-man coll.). This is a very handsome species, quite different in color-pattern from other members of the genus.

Genus PARALLAXIS McAtee.

Parallaxis MCATEE, Jour. N. Y. Ent. Soc. Vol. 34, 1926, p. 154.

25. *Parallaxis vacillans* McAtee. (Pl. XIV, figs. 16, 16a, 16b).

Parallaxis vacillans MCATEE, Jour. N. Y. Entom. Soc. Vol. 34, 1926, p. 155.

Head as wide as pronotum, vertex short, scarcely longer at middle than next the eye; pronotum two and one-half times as long as vertex; elytral veins 1 and 2 converging. *Genitalia*; last ventral segment of female long, hind border rounded; male valve hidden; plates narrowed at middle and extending as narrow upcurved tips, exceeding pygofer.

Light olive, suffused with golden; vertex with eight pale dots; anterior border of pronotum greenish; three dots on inner border of clavus and a dot on costa, pale subhyaline; apex smoky hyaline, and with hyaline spots on the base of apical and tips of discal cells. Length, 3 mm.

Two specimens, Bonda, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith coll.); seven specimens, Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith coll.). Two specimens Provincia del Sara Bolivia (Steinbach coll.) Feb. 1913, Carn. Mus. Acc. No. 5064. One specimen Jacaré, Minas Geraes, Brazil, Dec. 11, 1907 (Haseman coll.).

26. **Parallaxis ornata**, n. sp. (Pl. XIV, fig. 17).

Head broad, slightly wider than pronotum, subangulate; vertex scarcely longer at middle than next the eye; pronotum two and a half times as long as vertex; elytral vein, bent toward 2 and with spur, 2 and 3 approximate near end, almost uniting to form an antapical areole. *Genitalia*, last ventral segment of female as long as preceding, slightly produced.

Vertex gray with fuscous triangular spots on disk; pronotum with a broad patch of fulvous on the disk and a pair of small fuscous dots connected by a fine line with another dot behind each eye; scutellum yellow with dusky dots at base; elytra pale gray, subhyaline, with two elongate splashes on the clavus and two on inner part of corium, reddish brown; apical part hyaline with fuscous band over the cross-veins and a distinct light fuscous spot on costa; front smoky with three whitish arcs near base; legs and abdomen blackish, abdominal segments margined with whitish. Length, 2.5 mm.

Two female specimens (type and paratype) Bonda, Colombia, Carn. Mus. Acc. No. 1999 (H. H. Smith *coll.*). One female (paratype) from Cacagualito, Colombia May 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith). The latter specimen is not so strongly colored as the others, but agrees perfectly in color-pattern as well as in structural details.

27. **Parallaxis guzmani** (Baker).

Erythria guzmani BAKER, Invertebrata Pacifica, I, 1903, p. 4.

Parallaxis clathrata MCATEE, Jour. N. Y. Entom. Soc., Vol. 34, 1926, p. 157.

Head scarcely as wide as pronotum, subangulate; vertex a little longer at middle than next the eye; pronotum more than twice as long as vertex; scutellum small; discal sectors of elytra united by cross-veins forming two antapical areoles. Last ventral segment of female rounded behind; male valve large, rounded or faintly angulate behind, plates short, triangular, the blunt tips exceeding the pygofer.

Pale olive, vertex greenish white, with two fuscous spots near tip and a transverse line near the base; pronotum with the anterior border pale greenish with a series of dusky dots near the margin, disk with a faint median whitish line bordered with darker, hind margin greenish white; elytra pale olive with darker olive spots, two on clavus, two on disk of corium and an elliptical one at middle of costa, including subcostal vein, preceded and followed by a fuscous patch; veins pale greenish, bordered narrowly with fuscous; first apical cell deep fuscous, second and third and inner apical cells mostly smoky; beneath face olive, with faint arcs, lower part fuscous; venter blackish. Length, 22.25-2.5 mm.

Five specimens from Los Amates, Guatemala, Feb. 25, 1905 (J. S. Hine) in Collection of Ohio State University. Baker's description was based on specimens collected at San Marcos, Nicaragua; and McAtee's description of *clathrata*, which I am confident is the same, on specimens from Honduras and the Canal Zone, Panama.

28. **Parallaxis rufula**, n. sp. (Pl. XIV, figs. 18, 18a).

Head as wide as pronotum, subangulate; vertex nearly half longer at middle than next the eye; pronotum twice as long as vertex; elytral veins 2 and 3 converging. *Genitalia*; male valve small, hidden; plates broad at base, tapering evenly to acute slightly upturned tips.

Dull rufous; vertex yellowish with fuscous transverse bar and basal spot; pronotum anteriorly dull yellowish with fuscous markings, hind border whitish; scutellum and elytra rufous, the latter with hyaline spots in the tips of the discal and bases of the apical areoles; veins reddish, narrowly bordered with fuscous; beneath dusky; front yellowish, with fuscous arcs and central stripe. Length, 3 mm.

Described from two males (type and paratype) from Provincia del Sara, Bolivia (Steinbach) Feb., 1913, Carn. Mus. Acc. No. 5064.

Genus DIKRANEURA Hardy

Dikraneura HARDY, Transactions Tyneside Nat. Field Club, Vol. I, 1850, p. 423.

29. **Dikraneura marginella** Baker.

Dikraneura marginata DELONG, Jour. N. Y. Ent. Soc., Vol. XXXII, 1924, p. 68.
Dikraneura marginella (nom. nov.) BAKER, Philippine Jour. Sci., Vol. XXVII, 1925, p. 160.

Small, head distinctly angular, scarcely as wide as pronotum. Vertex broad, width between eyes equal to length at middle, length at middle twice as long as at the eye, border obtusely angular. Pronotum slightly concave behind. Last ventral segment of female slightly produced, obscurely angulate.

Pale olive; vertex slightly paler, with ivory-white anterior border, below which is a black line, followed by a whitish line, extending from eye to eye; a small yellowish spot just above base of antennæ; anterior border of pronotum and the scutellum dull yellowish; elytra uniformly olive, except apical cells, which are sub-hyaline. Length, 2.25 mm.

One female specimen, from Gualan, Guatemala, Feb. 14, 1905 (J. S. Hine) in Collection of Ohio State University, and a full series from Panama and the Canal Zone, where it was collected by the writer in considerable numbers from grass during May, 1927. This very small species is to be recognized by the distinctly olivaceous color and the conspicuous markings of the vertex.

30. **Dikraneura parana**, n. sp. (Pl. XIV, figs. 19, 19a).

Slender; head as wide as pronotum, angular. Vertex produced, one-half longer at middle than next eye, rounded at tip, ocelli close to eye; pronotum scarcely longer than vertex, distinctly emarginate. Elytra narrow. Last ventral segment of female nearly twice as long as preceding, produced, subangulate at middle. Valve of male rounded behind, plates small, elongate, triangular; tips slender, upturned.

Ivory-white; a stripe on either side of middle on pronotum, extending over angles of scutellum, converging on inner border of clavus, pale fulvous; apical cells faintly smoky; male with dusky dots at tip of clavus and in base of second apical cell, and with fulvous streak bordering claval suture on corium. Length, 3 mm.

One female (holotype), one male (allotype) Parà, Brazil, Dec. 6, 1907. Carn. Mus. Acc. No. 3533 (Haseman *coll.*).

31. **Dikraneura oculea** n. sp. (Pl. XIV, figs. 20, 20a).

Head rather broad, wider than pronotum; eyes large, prominent; vertex short, rounded in front, ocelli close to eye; pronotum short, half longer than vertex; elytral borders nearly parallel; male valve large, twice as long as preceding segment, rounded behind; plates elongate, triangular, densely ciliate, tips acute, extending beyond tip of pygofer.

Pale yellow, tip of vertex, disk of pronotum, internal border of clavus, and broad stripe on corium bordering claval suture, fading posteriorly, orange. Eyes black; abdomen yellow. Face and legs whitish. Length, 3.5 mm.

One male (holotype) Provincia del Sara, Bolivia, Dec. 1912 (Steinbach) Carn. Mus. Acc. No. 5064.

32. **Dikraneura sarana**, n. sp. (Pl. XIV, figs. 22, 22a).

Head wider than pronotum; eyes large; vertex narrow at base widening to front border of eye. Vertex obtusely angulate, one-fourth longer at middle than next the eye. Pronotum one-fourth longer than vertex, rather deeply emarginate; elytra long, margins nearly parallel. Last ventral segment of male long, one-half longer than preceding, plates narrow, tapering gradually to slender tips, scarcely reaching tip of pygofer.

Ivory-white; the vertex, two broad stripes on pronotum, inner border of clavus, and broad stripe bordering claval suture, bright fulvous. Below ivory-white. Length, 3 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

33. *Dikraneura kunzei*, Gillette.

Head wider than pronotum, subangulate; vertex one-third longer at middle than at eye. Pronotum as long as vertex. Last ventral segment of female twice as long as preceding, rounded behind.

Greenish, tinged with golden yellow; vertex and front suffused with fulvous; elytra hyaline, tinged with golden green, apex very faintly smoky, strongly iridescent. Length, 2 mm.

One female specimen, Los Amates, Guatemala, Feb. 25, 1905. In Collection of Ohio State University (J. S. Hine). A beautifully iridescent little species. The Guatemalan specimens lack the whitish border of the vertex, which is present in my Texan specimens, but otherwise I find no basis for separation.

34. *Dikraneura affinis*, n. sp. (Pl. XIV, figs. 24, 24a, 24b).

Head as wide as pronotum, subangulate, vertex half longer at middle than next the eye, obtusely angled to front; front convex. Pronotum one-half longer than vertex, hind border faintly emarginate; scutellum small. Last ventral segment of male longer and narrower than preceding; valve hidden; plates elongate, triangular, tips acute, slightly upturned. Last ventral segment of female twice as long as preceding, hind border broadly rounded at sides, produced at middle, tip slightly sinuate.

Olive; border of vertex ivory-white with a fuscous sub-margin bordering inner angle of eye, and extending along margin of pronotum inside the ivory-white border. Tips of elytra subhyaline, slightly smoky; beneath suffused with dull fulvous, abdomen above and basal segments beneath, blackish. Length, 2 mm.

Described from two specimens, female (holotype), male (allotype) Bonda, Colombia, July, 1898, Carn. Mus. Acc. No. 1999 (H. H. Smith coll.). This appears to be quite close to *D. albonasa* McAtee, but it differs in having a distinct blackish submargin for the ivory-white border of vertex and pronotum, and the profile is more angular than indicated in McAtee's figure.

35. *Dikraneura attenuata*, n. sp. (Pl. XIV, figs. 30, 30a).

Slender. Head as wide as pronotum. Vertex narrow at base, widening to anterior border of eyes, angulate, half longer at middle than next the eye. Pronotum as long as vertex, distinctly emarginate; last ventral segment of male long; valve hidden; plates slender, narrowing to slender, upturned tips, extending beyond the tip of pygofer.

Pale yellow or ivory-white; pronotum and scutellum tinged with

little more distinct yellow; inner border of elytra and a subcostal streak, pale fulvous; beneath whitish; abdomen a little more distinctly yellow. Length, 3.25 mm.

One specimen, male (holotype) Provincia del Sara, Bolivia, Feb. 1913 (Steinbach) Carn. Mus. Acc. No. 5064.

36. *Dikraneura obliquata*, n. sp. (Pl. XIV, figs. 28, 28a).

Slender; head scarcely wider than pronotum; vertex produced, nearly twice as long at middle as next the eye, angulate, rounded at tip; pronotum slightly longer than vertex. Last ventral segment of male half longer than preceding; valve short; plates broad at base, contracted near middle, tips slender, upturned, exceeding tip of pygofer.

Pale yellow. Interrupted band on vertex with a spot at tip, extending down the base of front and connected with a spot at tip; a spot on hind border of pronotum and a number of irregular spots on elytra, three on clavus, and a broken series on disk of corium, an oblique streak on costa and apical areoles, orange-red. Beneath pale yellow, or whitish. Length, 2.5 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (Steinbach), Carn. Mus. Acc. No. 5064.

37. *Dikraneura bilineata*, n. sp. (Pl. XV, figs. 34, 34a).

Slender; head scarcely as wide as pronotum. Vertex produced, angular, twice as long at middle as next the eye and bluntly angled to front. Front convex. Pronotum scarcely as long as vertex. Valve of male short, transverse, about half as long as preceding segment; plates broad at base, tapering uniformly to acute tips, reaching tip of pygofer.

Light yellow with sanguineous markings; vertex with two triangular sanguineous patches extended as a broad stripe over pronotum and angles of scutellum. Pronotum with fulvous patch at border, a black line bordering vertex paralleled by another slender black line on base of front, extended back of the eye as narrow lines on the pronotum. Elytra sanguineous with yellowish patches on the claval vein; apical half smoky subhyaline; veins whitish, margined with fuscous; tergum dusky. Face beneath, yellowish, tinged with red; venter yellow, with fuscous submargins and spots on connexivum; legs whitish, tips of tarsi dusky. Length, 3 mm.

Two males (holotype and paratype) Provincia del Sara, Bolivia (Steinbach), Carn. Mus. Acc. No. 5064. Distinctly characterised by the two delicate black lines bordering vertex and base of front.

38. **Dikraneura pellucida**, n. sp. (Pl. XVI, figs. 54, 54a).

Head wider than pronotum, subangulate; vertex little longer at middle than next the eye. Pronotum one-third longer than vertex, concave behind. Male valve short, subangulate; plates broad at base, narrowed to acute points, as long as pygofer.

Pale yellowish; vertex and front and anterior part of pronotum tinged with fulvous; elytra subhyaline; clavus tinged with yellow and with dusky apex; apical cells slightly smoky; beneath pale yellow. Length, 3 mm.

One male specimen (holotype) Provincia del Sara, Bolivia, 450 M. Dec. 1918 (J. Steinbach), Carn. Mus. Acc. No. 6443.

39. **Dikraneura breviceps**, n. sp. (Pl. XIV, figs. 26, 26a).

Head as wide as pronotum, short; vertex scarcely longer at middle than next eye, rounded; pronotum nearly twice as long as vertex. Last segment of male large, convex, rounded behind; plates small, elongate, triangular, with acute tips; margins densely ciliate.

Pale yellow, vertex and front tinged a little with fulvous, elytra subhyaline; abdomen above and below, yellow; lower part of face, and feet, whitish; tips of tarsi dusky. Length, 3 mm.

Three males (holotype and paratypes) Provincia del Sara, Bolivia (Steinbach), Carn. Mus. Acc. No. 5064. Very similar to *D. alebroidea*, but the head is somewhat shorter and the male plates differ somewhat in shape.

40. **Dikraneura alebroidea**, n. sp. (Pl. XIV, figs. 23, 23a).

Head wider than pronotum, vertex slightly produced, broader than long. Pronotum nearly twice as long as vertex. Last ventral segment of male large, convex, hind border rounded; plates small, elongate, triangular, with acute tips reaching tip of pygofer, clothed with fine ciliate hairs.

Pale yellow, tinged with fulvous; eyes black, ocelli transparent. Length, 3 mm.

Two males (holotype and paratype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

41. **Dikraneura albidula**, n. sp. (Pl. XIV, figs. 27, 27a).

Head almost as wide as pronotum; eyes large. Vertex narrow at base, widening anteriorly, distinctly angulate, nearly twice as long at middle as at eye. Front convex, angulate from side view. Pronotum as long as vertex, distinctly emarginate behind. Elytra narrow, margins parallel, apex rather broad, flaring. *Male genitalia*, last

ventral segment as long as preceding, truncate; plates narrow, basal half polished, apical part slender, acutely pointed, tips upturned, reaching tip of pygofer.

Ivory-white; vertex, disk of pronotum and margin of elytra, base of costa, tinged with fulvous; fulvous area and middle of apical area with a distinct subfuscous dot. Eyes black. Beneath ivory-white. Length, 3.5 mm.

One male (holotype) Provincia del Sara, Bolivia (J. Steinbach) Carn. Mus. Acc. No. 5064.

42. **Dikraneura quadrifasciata**, n. sp. (Pl. XIV, figs. 21, 21a).

Head scarcely as wide as pronotum, angulate, eyes large; vertex narrow at base, widening to anterior border of eye; pronotum one-fourth longer than vertex, deeply emarginate and sinuate behind. Elytral veins indistinct. Last ventral segment of male long, half longer than preceding. Plates narrow, elongate, triangular, tapering to acute upturned tips, exceeding pygofer.

Pale yellow; disk of vertex, two broad stripes on pronotum, outer angles of scutellum, broad stripe on inner part of elytra, and a somewhat narrower stripe bordering the costa broken subapically, golden fulvous. Beneath pale yellow, or whitish; abdomen more distinctly yellowish, tips of tibiae and tarsal joints dusky. Length, 2.75 mm.

Three male specimens, (holotype and paratypes), Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

43. **Dikraneura maculosa**, n. sp. (Pl. XIV, figs. 29, 29a).

Head as wide as pronotum, much produced. Vertex twice as long at middle as at eye, angulate, tip rounded; pronotum one-fourth longer than vertex, concave behind; elytra long and narrow. Last ventral segment of male one-half longer than preceding; plates broad at base, tapering gradually to slender tips, as long as pygofer.

Golden yellow, sides of vertex washed with red. Pronotum with three fulvous stripes. Scutellum with basal angle and tip fulvous; elytra densely maculate with fuscous, a golden wash behind. Clavus and apical veins white; areoles smoky. Face minutely maculate with whitish; cheeks red, abdomen yellow. Length, 2 mm.

This is a small, slender species, with a very distinctly angular head and marked particularly by the numerous fuscous spots on elytra. Two males (holotype and paratype) Dec. 1912 (Steinbach), Carn. Mus. Acc. No. 5064.

44. **Dikraneura panamana**, n. sp.

Head wider than pronotum, subangulate. Vertex slightly produced, one-fourth longer at middle than at eye. Pronotum one-third longer

than vertex, distinctly concave behind. Last ventral segment of female elongate, twice as long as preceding, rounded behind.

Pale yellow. Pronotum with a central ivory-white stripe extending on to scutellum; basal angles of scutellum pale fulvous; inner border of clavus and inner areole of corium tinged with golden. Elytra whitish hyaline, tips faintly smoky. Beneath ivory-white. Length, 3.5 mm.

One specimen (holotype), Canal Zone, Panama. In author's collection.

45. *Dikraneura delicata*, n. sp.

Head scarcely as wide as pronotum, angulate. Vertex produced, twice as long at middle as next the eye. Pronotum one-half longer than vertex. Last ventral segment of female long, twice as long as preceding, rounded behind, ivory-white. Elytra whitish hyaline, iridescent. Length, 2 mm.

One female specimen (holotype) Los Amates, Guatemala, Feb. 25, 1905. In author's collection.

46. *Dikraneura suffusa*, n. sp.

Head as wide as pronotum, angulate; vertex produced, one-half longer at middle than at eye. Pronotum one-third longer than vertex. Last ventral segment of female twice as long as preceding, truncate.

Vertex and face pale olive, suffused with fulvous. Pronotum reddish brown, anterior and lateral border whitish, scutellum whitish, base tinged with fulvous, elytra whitish hyaline, clavus and corium each with two large reddish brown spots, apex faintly smoky, veins whitish. Tergum and base of venter dusky; legs greenish; tips of tibiae and tarsi bluish. Length, 2.5 mm.

Two females (holotype and paratype) Los Amates, Guatemala, Feb. 25, 1905. In author's collection.

47. *Dikraneura fasciata*, n. sp. (Pl. XV, fig. 31).

Slender; head wider than pronotum; eyes large; vertex slightly narrow, rounded, subangular anteriorly; front convex; pronotum one-third longer than vertex, distinctly emarginate behind. Last ventral segment of male as long as preceding; plates wide at base, sinuate on margin, short, acute, with upturned tips.

Pale yellow; vertex with rather broad stripe on each side, meeting at apex, extending down the front and along border converging at apex and covering most of clypeus; a broad stripe on each side of pronotum, a narrower stripe behind the eye, widened on base of elytra. A broad stripe on clavus and another on inner part of corium, orange-red. Beneath whitish. Length, 2.75 mm.

One male (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

48. **Dikraneura parallela**, n. sp. (Pl. XIV, figs. 25, 25a).

Slender; head scarcely as wide as pronotum, angulate; eyes large; vertex narrow, widening anteriorly, rounded to front; front convex; pronotum one-third longer than vertex, deeply emarginate behind; elytra narrow, margins parallel. Last ventral segment of male as long as preceding, valve wanting; plates elongate, triangular, margin slightly sinuate, tips acute, slightly upturned, reaching three-fourths length of pygofer.

Pale yellow. Vertex, pronotum, and inner half of elytra, orange-red; costal margin broadly yellow. Beneath pale yellow. Face and legs whitish. Eyes black. Length, 3 mm.

One specimen male (holotype) Provincia del Sara, Bolivia (Steinbach) Dec. 1912, Carn. Mus. Acc. No. 5064.

49. **Dikraneura sandersi** Ball and DeLong.

Dikraneura sandersi BALL and DELONG, Annals Ent. Soc. Am., Vol. XVIII, 1925, p. 332.

Dikraneura sandersi MCATEE, Jour. N. Y. Ent. Soc., Vol. XXXIV, 1926, p. 164.

Head wider than pronotum somewhat depressed; vertex produced, subangulate, rounded to front; face tumid. Last ventral segment of female long, angularly produced; valve of male rounded behind; plates long, narrow, tapering gradually to slender tips.

"Color bright yellow to orange. Vertex, pronotum, and scutellum often washed with orange. Elytra yellowish subhyaline, in well marked specimens with a minute black spot on inner basal angle of inner apical cell." Length, 2.5 mm.

This species was described from specimens taken at "Panama City, Canal Zone" Jan. and May, 1921, by J. G. Sanders.

Subgenus HYLOIDEA McAtee

Hyloidea MCATEE, Jour. N. Y. Entom. Soc., Vol. XXXIV, 1926, p. 162.

The species, Nos. 50-61, with the one (*H. depressa*) described by McAtee from Porto Rico, constitute a very interesting group, the very pronounced flattening of the body with plane of vertex and front nearly, or in some of the species, quite parallel, separating them at once from any of the allied groups. They might very properly form a genus, the central home of which would be the upper Amazons valley, and from the much depressed form of the body it may be inferred that they have the habit of living under the leaves or leaf-sheaths of plants, possibly grasses, or plants of the grass-family.

50. *Dikraneura* (*Hyloidea*) **splendidula**, n. sp. (Pl. XV, figs. 32, 32a).

Head broad, distinctly wider than pronotum; eyes large: vertex obtusely angulate, half longer at middle than next the eye, rounded to front; front depressed. Pronotum one-third longer than vertex, hind border faintly concave; elytra broad, margins nearly parallel. Last ventral segment of male a little shorter than preceding; plates small, triangular, tips acute.

Vertex, pronotum, scutellum, base, and apex of elytra, bright red. Margin of vertex, four round spots across the disk, two large and two smaller spots on anterior border of pronotum, tip of clypeus, a broad band across elytra, yellow. Hind border of pronotum, a subhyaline spot on costa, and several spots on the apical cells and apical border, irregularly whitish. Front ivory-white at base, reddish brown on disk; abdomen yellow; feet whitish, anterior tibiae and tarsi smoky. Length, 2.5 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

51. *Dikraneura* (*Hyloidea*) **disconotata**, n. sp.

(Pl. XV, figs. 33, 33a, 33b).

Slender, depressed, head slightly wider than pronotum. Eyes large; vertex distinctly angulate, nearly twice as long at middle as next the eye; front flattened apically. Pronotum a little longer than vertex, emarginate behind; scutellum large; elytral margins parallel, apex angled. Last ventral segment of female as long as preceding, slightly produced and subangulate. Pygofer rather slender with a few bristles toward tip. Valve of male broad and short, plates short, rather blunt at tips, with a few bristles and a fringe of cilia on outer margin, as long as pygofer.

Ivory-whitish. A large round black spot on anterior part of disk of vertex and on disk of pronotum, and a blackish border at apex of scutellum. A dot on vertex behind the black spot and scutellum, fulvous. Elytra subhyaline, with faint yellowish stripes; apical cell bordered with smoky. Beneath whitish. Line next to antennae and the eyes black. Length, 2.5 mm.

One female specimen (holotype), Bahia, Brazil, Jan. 7, 1908. Carn. Mus. Acc. No. 3775 (Haseman) and one male (allotype) Cachoeira, E. Santos, Brazil, June 19, 1908, Carn. Mus. Acc. No. 3579 (Haseman). A very handsome little species, distinctly marked by the two conspicuous round spots.

52. **Dikraneura** (*Hyloidea*) **hyalina**, n. sp. (Pl. XV, fig. 35).

Subdepressed, head almost as wide as pronotum, angulate; vertex twice as long as long at middle as next the eye; front convex at base, depressed apically. Pronotum a little longer than vertex, hind border subtruncate. Male valve rounded behind, plates triangular, acute at tip, minutely ciliate.

Vertex and base of front ivory-white; pronotum bright red, with a whitish patch on front margin and a fuscous submarginal band, narrowing at sides, hind border whitish. Elytra hyaline with a red mark on base of clavus and inner margin of corium and a broad red band on apical third. Length, 2 mm.

One specimen (holotype) Las Juntas, Bolivia (Steinbach) Carn. Mus. Acc. No. 5066. Distinguished by the hyaline elytra and the thicker or less depressed head.

53. **Dikraneura** (*Hyloidea*) **fumida**, n. sp. (Pl. XV, figs. 36, 36a).

Broad and depressed; head wider than pronotum; vertex produced, nearly twice as long at middle as at eye; roundly angulate, flat; front broad at base, contracted below eyes; pronotum little longer than vertex; elytral veins indistinct. Male valve truncate behind; plates triangular, tips acute, upturned, exceeding the pygofer.

Vertex, pronotum, scutellum, clavus, and inner part of corium, covered with a broad dark brown stripe, leaving borders of vertex and lateral margins of pronotum and a subcostal stripe, yellow. Front and clypeus, legs, and costa, fulvous; abdomen yellow beneath. Length, 2 mm.

One male specimen (holotype) from Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

This species agrees pretty closely with *H. depressa* McAtee, the type of the subgenus, but the dark coloration extends along the inner part of the elytra, and it lacks the black tip of the scutellum and the dark spots on the elytra.

54. **Dikraneura** (*Hyloidea*) **eburnea**, n. sp. (Pl. XV, figs. 39, 39a).

Depressed, head broad; vertex produced, about twice as long at middle as at eye; disk nearly flat; front fairly full at base, depressed between eyes; pronotum as long as vertex. Male valve large, angulate behind; plates very small, triangular, tips acute, upturned, as long as pygofer.

Eyes black; vertex, except at base, pronotum and elytra ivory-white; base of vertex, narrow anterior margin of pronotum, scutellum, and base of elytra, orange; costa with a bright red mark before and after

the costal plaque; beneath, base of front, sternum and feet, white; abdomen pale yellow. Length, 2 mm.

Described from one male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064. This is a very beautiful ivory-white species, distinctly marked with orange and red.

55. **Dikraneura** (*Hyloidea*) **fulva**, n. sp. (Pl. XV, figs. 38, 38a).

Distinctly depressed, head slightly wider than pronotum, bluntly angulate; vertex nearly twice as long at middle as at eye; front flattened; pronotum scarcely longer than vertex; elytral veins indistinct; last ventral segment of male truncate; valve angulate; plates rather short, triangular, tapering to acute curved tips.

Fulvous, a little more deeply tinged on the disk of vertex and pronotum; border of vertex and pronotum and the abdomen above and below yellow; elytra quite uniformly light fulvous, of a little deeper tinge on inner part of clavus; a distinct black dot on costa at base of first apical areole and another at base of inner or tip of clavus; legs fulvous. Length, 3 mm.

Described from five male specimens (holotype and paratypes) from Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064. This is the largest species noted in the subgenus and distinctly marked by the black dots of the elytra.

56. **Dikraneura** (*Hyloidea*) **flavida**, n. sp. (Pl. XV, figs. 37, 37a).

Small; head scarcely as wide as pronotum, distinctly angulate and subconical; vertex twice as long at middle as at eye, rounding to blunt margin; front depressed; pronotum as long as vertex; elytral veins indistinct. Valve of male triangular; plates broad at base, narrowing evenly to acute upturned tips.

Pale yellow, disk of pronotum and tip of scutellum and inner part of elytra suffused with fulvous; base of scutellum and wings whitish; beneath pale yellow. Length, 1.5 mm.

Described from one specimen, male (holotype) from Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

57. **Dikraneura** (*Hyloidea*) **laticeps**, n. sp. (Pl. XV, fig. 45).

Head very broad, much wider than pronotum, rather large. The vertex short, subangulate, one-fourth longer than next the eye. Front convex from a side view, apical part in a nearly parallel plane with vertex. Pronotum one-half longer than vertex, hind border slightly emarginate; elytral veins indistinct. Last ventral segment of male truncate; valve minute or wanting; plates elongate, slender, exceeding tip of pygofer.

Pale yellow; disk of vertex, pronotum and scutellum, clavus, and broad stripe on corium, pale fulvous; elytra minutely dotted with fuscous; beneath pale yellow; eyes black. Length, 3 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

58. *Dikraneura* (*Hyloidea*) *rosea*, n. sp. (Pl. XV, figs. 40, 40a).

Head scarcely as wide as pronotum, distinctly angulate. Vertex twice as long at middle as next the eye, bluntly angulate to front. Front convex at base, depressed apically. Pronotum as long as vertex, hind border emarginate; elytral veins fairly distinct. Last ventral segment of male long; plates long, tapering gradually from middle to slender upturned tips, exceeding pygofer.

Brownish, disk of vertex and pronotum somewhat suffused with rosy, elytra subhyaline, corium largely suffused with fulvous, apex slightly smoky. Front dark brown, bordered at base with narrow whitish line. Abdomen yellow, dusky at base. Legs pale, tarsi blackish. Length, 2 mm.

Described from one male specimen (holotype) Guadalajara, Mexico (Crawford) Carn. Mus. Acc. No. 3901.

59. *Dikraneura* (*Hyloidea*) *lineata*, n. sp. (Pl. XV, figs. 43, 43a).

Head slightly wider than pronotum, distinctly angulate; vertex twice as long at middle as next the eye; front slightly convex at base, depressed at apex and on side view scarcely parallel with vertex. Pronotum a little shorter than vertex, hind border emarginate. Scutellum large, elytral veins indistinct. Last ventral segment of male concave; valve short or wanting, plates apparently fused at base, slightly divergent beyond the middle and converging to tips; tips sinuate, the angles produced into minute teeth.

Light yellow; disk of vertex, pronotum, scutellum, and inner border of elytra light fulvous with a median rather broad yellowish white line from tip of vertex to tip of scutellum, narrowly continued on margin of clavus; costa fulvous on basal half, a faint fuscous oblique line at base and apex of costal plaque, and a broken fuscous line on cross-nervures. Second apical cell partly fuscous. Beneath pale yellow; face and legs whitish. Length, 2.5 mm.

Described from one male specimen (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

60. *Dikraneura* (*Hyloidea*) *micronotata*, n. sp. (Pl. XV, figs. 44, 44a).

Head slightly wider than pronotum, subangulate; vertex one-half longer at middle than next the eye; front depressed. Pronotum one-half longer than vertex, hind border truncate; scutellum small; elytra

broad, apex subtruncate. Last ventral segment of male as long as preceding; valve short, plates broad at base, triangular; tips short, acute, reaching beyond tip of pygofer with a blunt tooth on each side near tip.

Pale gray above; vertex with two large red spots on disk, anterior border ivory-white. Pronotum with a red spot on anterior border behind inner margin of eye and two discal spots near hind border; pronotum streaked with red; elytra gray with red oblique spot on corium before the middle and another just before the cross-veins. Inner and antapical areoles also reddish. Entire surface of vertex, pronotum and elytra with minute dark reddish dots. Apical areoles faintly smoky. Veins whitish. Beneath ivory-white, apex of front and clypeus blackish. Tergum and venter blackish with margins ivory-white. Length, 2.25 mm.

Three male specimens (type and paratypes) Provincia del Sara, Bolivia (Steinbach) Nov. 1912, Carn. Mus. Acc. No. 5064. A very handsome little species, particularly marked by the numerous minute dots.

61. *Dikraneura* (*Hylodea*) *reticulata*, n. sp. (Pl. XV, figs. 41, 41a).

Head little narrower than pronotum; eyes rather small; vertex large, slightly convex, sloping anteriorly, bluntly angulate, twice as long at middle as next the eye; front flattened, much depressed. Pronotum a little longer than vertex, hind border truncate; elytra broad, costa distinctly arched, venation reticulate, apical part membranous. Last ventral segment of female as long as preceding, slightly produced at middle with a minute median notch; pygofer short, ovipositor barely exceeding tip of pygofer.

Pale yellow, suffused with rose and fulvous. Vertex yellow with oblique orange spots. Pronotum light yellow, with six orange-red patches and numerous minute fuscous dots. Scutellum with basal angles, apex, and two dots on disk, fuscous. Elytra suffused with pink on base and membrane. A broad band on clavus and most of corium fulvous, with numerous large ivory-colored spots corresponding with the areoles in outer portion. Membrane hyaline, minutely reticulate with rosy veins. Costal plaque whitish, slightly suffused with pink. Beneath whitish. Length, female, 3 mm.

One female specimen (holotype) from Januaria, Minca, Brazil, Dec. 17, 1907. Carn. Mus. Acc. No. 3702 (Haseman). This is a very handsome species, distinctly flattened and with exceptionally broad elytra. The tips of the wings are broken but the species evidently falls in the *Dikraneurine* series and appears closely related to species of *Hylodea*, but additional specimens may show details of venation which will warrant the forming of a new genus.

Genus *ALCONEURA* Ball and DeLong.

Alconeura BALL and DELONG, Annals Entom. Soc. Am., Vol. XVIII, 1925, p. 334.

62. *Alconeura quadrivittata* (Gillette).

Dikraneura 4-vittata GILLETTE, Proc. U. S. Nat. Mus., Vol. XX, 1898, p. 723.

Alconeura 4-vittata BALL and DELONG, Annals Ent. Soc. Am., Vol. XVIII, 1925, p. 334.

Dikraneura (Alconeura) quadrivittata MCATEE, Jour. N. Y. Ent. Soc., Vol. XXXIV, 1926, p. 163.

"Broad with an obtusely angled thick margined vertex, tawny red to just before the apical cells. The anterior margin and a median stripe on vertex white, three narrow stripes and the lateral margins of the pronotum white. Elytra pale, all the clavus, except the margin, an interrupted stripe on the corium next the suture, and an oblique dash near the middle, tawny. Nervures and cross-veins on apical third thickened, pale yellow with smoky margins. A large black dot in the angle of the first [inner] apical cell. First apical broad, its base oblique, first apical nervure arising from the apex of second sector and curving around the black dot. Third apical small, triangular, almost oval, with a short pedicel, fourth apical semicircular. *Genitalia*: Male, valve apparently concealed, plates rather long, gradually tapering to acute tips, apparently with the side margin folded upward. Length 2.5 mm." (Ball and DeLong.)

The original description was from a specimen from Long Island, Bahamas. The species has not been collected since.

Genus *JORUMA* McAtee.

Joruma MCATEE, Florida Entomologist, Vol. VIII, 1924, p. 34.

This genus was based on the presence of an open and one or two closed apical cells in the wing, and on the presence of ocelli. Since all the species of *Empoasca* that I know, as well as the genera *Alebra* and *Protalebra* have well developed, though sometimes inconspicuous, ocelli, this character cannot be given great weight and is certainly of little value in practical recognition of the species. The venation, however, is probably a more distinctive feature, and, when discernible, will serve to separate the species from *Empoasca*, while the presence of ocelli will distinguish them from *Dikraneura* and allied forms. Some of the species have very brilliant coloration, notably *J. coccinea* and *J. cingulata*.

63. *Joruma coccinea*, McAtee. (Pl. XVI, figs. 46, 46a).

Joruma coccinea MCATEE, Jour. N. Y. Ent. Soc., Vol. 34, 1926, p. 166.

Head broad, as wide as pronotum. Eyes globular. Vertex narrow, extending slightly beyond the eyes; ocelli distinct. Pronotum scarcely

as long as vertex, slightly emarginate behind. Last ventral segment of female long, produced into a long tooth behind. Pygofers narrow, exceeded by ovipositor.

Brilliant red; tips of elytra hyaline, legs whitish. Length, 3 mm.

One specimen of this brilliant red species from Las Juntas, Bolivia (Steinbach) Carn. Mus. Acc. No. 5066. Agrees very perfectly with a description by McAtee of the female from Costa Rica.

64. **Joruma cingulata**, McAtee. (Pl. XVI, figs. 47, 47a).

Joruma cingulata MCATEE, Jour. N. Y. Ent. Soc., Vol. 34, 1926, p. 167.

Head wider than pronotum, rounded before; vertex little longer at middle than next the eye. Pronotum nearly as long as vertex. Last ventral segment of male long, valve hidden, plates narrow, tapering to slender acute upturned tips as long as pygofer.

Deep red, with broad hyaline whitish band across the elytra behind tip of scutellum. Apex smoky hyaline. Beneath dull whitish.

A specimen from Las Juntas, Bolivia (Steinbach) Carn. Mus. Acc. No. 5066.

65. **Joruma fuscoclavata**, n. sp. (Pl. XVI, fig. 48).

Head as wide as pronotum, subangulate; vertex half longer at middle than next the eye; front narrow, tapering gradually to clypeus. Pronotum as long as vertex. Elytra rather broad. Genitalia wanting.

Bright red. Vertex on anterior border ivory-white, ocelli black; front at base, and apex, red, with colorless patch on disk. Clypeus and cheeks red. Pronotum red, scutellum dull gray, apex tinged with red; clavus and broad stripe on corium dull fuscous; stripe on inner border of corium and apical patch red; membrane smoky. Length, 2 mm.

One specimen (holotype) Las Juntas, Bolivia (Steinbach) Carn. Mus. Acc. No. 5066.

This is apparently quite similar to *albifrons*, McAtee, but he described that species as having vertex less pointed than *coccinea*; furthermore the color pattern of elytra seems to be distinct.

66. **Joruma nigricans**, n. sp. (Pl. XVI, figs. 49, 49a, 49b).

Head slightly wider than pronotum, subangulate. Vertex half longer at middle than next the eye, rounded to front; ocelli near border of eye; front convex. Pronotum nearly half longer than vertex, emarginate behind; elytra narrow, margins nearly parallel, widening apically. Last ventral segment of female long, three times as long as preceding, rather deeply sinuate, slightly produced at middle, pygofer slender, slightly exceeded by ovipositor. Last ventral segment of

male as long as preceding; valve minute; plates short, broad at base, narrowed triangularly beyond middle, with strongly upcurved, narrow, and blunt tips.

Vertex margined with brownish, lateral border of pronotum and tip of scutellum brownish. Elytra to tip of clavus dusky yellowish, apically blackish, veins of wing dusky. Beneath, face dusky olive, clypeus and legs fulvous, abdomen blackish above and beneath. In one specimen (the male), the face, clypeus, and legs are fulvous. Length, 2.5 mm.

Two females (type) and (paratype), one male (allotype). Las Juntas, Bolivia (Steinbach) Carn. Mus. Acc. No. 5066.

67. *Joruma guatemalana*, n. sp.

Head wider than pronotum, subangulate, vertex slightly produced, slightly longer at middle than at eye. Pronotum one-third longer than vertex. Last ventral segment of male twice as long as preceding, rounded behind; plates elongate, triangular, tapering to acute upturned tips exceeding the pygofer.

Pale olive; vertex, front, and scutellum on disk, slightly infusate; elytra greenish, hyaline; beneath dull olive, tips of tibiae and tarsi bluish green. Length, 2 mm.

One male specimen (holotype) Gualan, Guatemala, Feb. 14, 1905. Collection of Ohio State University.

68. *Joruma luciana*, n. sp.

Head scarcely as wide as pronotum, subangulate; vertex little longer at middle than at eye. Pronotum twice as long as vertex. Dull olive-gray, vertex with two large round black spots above ocelli. Eyes blackish, scutellum with blackish triangles in basal angles; elytra subhyaline, more or less infusate in areoles, veins whitish, costal plaque long, preceded and followed by faint fuscous patches. Beneath, face pale olive, border of front and the clypeus dusky, legs whitish, abdomen, tergum dusky, venter whitish, dusky at base. Length, 2.5 mm.

One specimen (type) from San Lucia, Guatemala, Feb. 1905, in Collection of Ohio State University, taken by J. S. Hine.

69. *Joruma canalis*, n. sp.

Head wider than pronotum, subangulate; vertex slightly produced, one-third longer at middle than at eye; pronotum one-third longer than vertex; elytra long. Last ventral segment of female twice as long as preceding, rounded behind.

Light fulvous; vertex and face with numerous yellowish elongate dots. Pronotum on outer border with six ivory-white dots; scutellum

with basal angles and spot near apex, ivory-white; elytra hyaline, faintly smoky toward tips, iridescent. Beneath pale yellow. Length, 3.5 mm.

Two specimens, females (holotype and paratype) Canal Zone, Panama, in author's collection.

70. *Joruma zonalis* n. sp.

Head as wide as pronotum, short; vertex little longer at middle than at the eye; pronotum one-half longer than vertex. Last ventral segment of male twice as long as preceding; plates triangular, tips acute, extending beyond tip of pygofer.

Dark olive tinged with red; vertex a little infusate at tip; ocelli black, encircled by yellowish; a line bordering eye greenish yellow, line on pronotum whitish extended to scutellum, where it is a little more yellowish. Three yellowish dots on anterior border. Yellowish dot on scutellum on each side near apex. Elytra brownish; on clavus and inner part of corium with bluish white spots; outer part of corium hyaline, apex hyaline, faintly smoky, veins whitish. Length, 2.5 mm.

One male specimen (holotype) from Canal Zone in author's collection.

71. *Joruma fumosa* n. sp.

Head wider than pronotum, subangulate; vertex little produced, one-third longer at middle than at eye. Pronotum as long as vertex; elytra narrow; last ventral segment of male short; plates very small, contracted beyond middle, tips slender, divergent, passing tip of pygofer.

Color dark olive; elytra smoky, vertex with anterior blackish line connecting dark spots including ocelli and an olive patch on disk, pronotum dark olive, anterior and lateral border fulvous; scutellum fulvous with olive triangles at base; elytra dark olive to tip of clavus; costal area somewhat tinged with golden, apex smoky with veins yellowish. Beneath greenish olive, tergum black, base of front slightly tinged with fulvous. Length, 2 mm.

Two male specimens (holotype and paratype) Los Amates, Guatemala, Feb. 1905, in Collection of Ohio State University, taken by J. S. Hine.

72. *Joruma ornata*, n. sp. (Pl. XVI, figs. 51, 51a).

Slender; head slightly wider than pronotum; eyes large; vertex obtusely angulate, rounded to front, slightly longer at middle than next the eye; front narrow, angulate or faintly carinate along middle line; pronotum slightly longer than vertex, nearly truncate behind. Last ventral segment of male large, rounded behind; plates narrow, tapering to acute, upturned tips.

Pale yellowish: the front and vertex, except middle line and two broad stripes on the pronotum, reddish; scutellum tawny, with a central whitish spot; elytra whitish hyaline; a curved stripe on clavus and running to costa and the apical cells, fuscous. Length, 2.5 mm.

One male (holotype) Provincia del Sara, Bolivia (Steinbach), Carn. Mus. Acc. No. 5064.

This species has rather the aspect of *Protalebra*, but in the specimen at hand there does not appear to be any appendix.

73. *Joruma hyalina*, n. sp.

Head slightly wider than pronotum, subangulate; vertex slightly produced, about one-fourth longer at middle than next the eye. Pronotum one-half longer than vertex. Wings with one apical cell. Last ventral segment of male elongate, rounded, truncate at tips; plates broad at base, narrowed to middle, extended as slender upturned and ciliate tips, extending beyond tip of pygofer.

Pale green, tinged with fulvous. Elytra hyaline-green, face greenish, tinged with olive on the front; abdomen yellowish; legs whitish, tips of tibiae and tarsi blue-green. Length, 2.5 mm.

One male (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064.

74. *Joruma subaurata*, McAtee. (Pl. XVI, figs. 50, 50a).

Joruma subaurata MCATEE, Jour. N. Y. Ent. Soc., Vol. 34, 1926, p. 168.

Head almost as wide as pronotum, vertex broad, subangulate, one-half longer at middle than next the eye, rounded to front. Pronotum nearly twice longer than vertex, faintly emarginate behind. Last ventral segment of female elongate, rounded, and slightly produced behind.

Pale olive. Vertex, pronotum, scutellum, clavus, and stripe on the disk of corium, pale old gold; elytra mostly pale hyaline, tips slightly smoky. Beneath: front tinged with fulvous; legs whitish; tips of tibiae and tarsi bluish green. Length, 2.5 mm.

Six specimens, Minca, Colombia, May 1898. Carn. Mus. Acc. No. 1999 (H. H. Smith). They differ from the description of *J. subaurata* in the pale ocelli and possibly in the amount of suffusion of the elytra.

75. *Joruma curvata*, n. sp. (Pl. XVI, figs. 52, 52a, 52b).

Small, slender; head as wide as pronotum. Vertex distinctly produced, obtusely angulate. Pronotum nearly as long as vertex. Scutellum large, nearly as long as pronotum; elytra narrow. Last ventral segment of female nearly twice as long as preceding, hind border produced, sinuate, with a broad shallow emargination at middle. Last

ventral segment of male as long as preceding, truncate, plates broad at base, narrowing rapidly to middle; tips long, parallel, strongly up-turned. Pygofer short, truncate, margined with black.

Pale yellow. A black dot including ocelli on border of vertex; disk of vertex with a forward extension at apex, pronotum (except a narrow lateral margin) scutellum, clavus, and dorsum of abdomen, black, or dusky. Corium yellowish hyaline, suffused with dusky on the inner margin and apical areoles; beneath pale yellow. Length, 2 mm.

Described from three specimens, one female (type), two males (allotype and paratype), from Lagoa Feia, Brazil, "at light," June 29, 1908 (Hasegan). Carn. Mus. Acc. No. 3579. This minute, but distinct, species is recognized particularly by the dusky dorsum contrasting with the pale yellow underside, and especially by the large, strongly curved male plates.

Genus EMPOASCA Walsh.

Empoasca WALSH, Proc. Bost. Soc. Nat. Hist., Vol. IX, 1864, p. 315.

76. *Empoasca rubromaculata*, n. sp. (Pl. XVI, figs. 59, 59a).

Similar to *picta*, but without the red border of front, and having three large red spots on pronotum, instead of two. Head wider than pronotum, produced, one-third longer at middle than next the eye, subangulate. Pronotum one-third longer than vertex. Elytra with costa rather strongly curved. Last ventral segment of male rounded, plates narrow, tapering to slender points, about one-half longer than preceding segment.

Green or bluish green, with conspicuous bright red spots. A broad band on vertex between the eyes, three large spots on pronotum, a conspicuous spot on propleura, and four elliptical spots on the elytra, bright red; those at end of clavus forming a common commissural spot. Length, 3.5 mm.

One male specimen (holotype) Provincia del Sara, Bolivia (J. Steinbach), Nov. 1912, Carn. Mus. Acc. No. 5064. This is very similar to *E. picta*, but the distribution of the red markings is so distinctly different that they cannot be considered as the same species.

77. *Empoasca picta* Osborn.

Annals of the Carnegie Museum, Vol. XV, 1924, p. 452.

78. *Empoasca decorata* Osborn.

Annals of the Carnegie Museum, Vol. XV, 1924, p. 452.

79. **Empoasca alboneura** Gillette.

Empoasca alboneura GILLETTE, Proc. U. S. N. M. Vol. XX, 1900, p. 743.

Head broad, slightly wider than pronotum, rounded before; vertex slightly longer at middle than next the eye. Pronotum nearly twice as long as vertex. Last ventral segment of female long, about twice as long as preceding, truncate behind.

Pale olive, or old gold, with a narrow line from tip of vertex to apex of scutellum, a broken band on anterior border of vertex near border of eye, a triangular patch behind eye on pronotum; margin of pronotum and elytral veins, pale bluish or whitish green; apical cells a little smoky. Beneath pale green; face and legs slightly tinged with fulvous. Length, 2.75 mm.

One female, Guadalajara (McConnell coll.) Carn. Mus. Acc. No. 3913.

80. **Empoasca emarginata**, n. sp. (Pl. XVI, figs. 53, 53a).

Head broad, wider than pronotum. Vertex slightly longer at middle than at eye. Pronotum about twice as long as vertex, distinctly emarginate on posterior border. Posterior ventral segment of male short, valve hidden or wanting; plates elongate, exceeding pygofer, slender, strap-like, expanding near tip and twisted and upturned.

Color pale yellow, possibly faded, with no distinct markings. Length, 3.1 mm.

Twelve male specimens (type and paratypes) from Provincia del Sara 450 M. (J. Steinbach) Carn. Mus. Acc. No. 6443.

81. **Empoasca fabæ** (Harris). (Pl. XVI, figs. 56, 56a, 56b).

Tettigonia fabæ HARRIS, Insects Injurious to Vegetation, 1841, p. 186.

Tettigonia mali LE BARON, Prairie Farmer, XIII, 1853, p. 330.

Empoasca viridescens WALSH, Prairie Farmer, Sept. 6, 1862; Rept. Bost. Soc. Nat. Hist., Vol. IX, 1864, p. 316.

Empoasca consobrina WALSH, (l. c.)

Chloroneura malefica WALSH, Prairie Farmer, Sept. 6, 1862; Rept. Bost. Soc. Nat. Hist., Vol. IX, 1864, p. 317.

Typhlocyba photophila BERG, Hemip. Argent., 1879, p. 273. (Vide GILLETTE, Proc. U. S. N. M. vol. XX, 1898, p. 744.)

Empoasca albopicta FORBES, 13th Rept. Ill. State Entomologist, 1883, p. 181, pl. XIV.

Empoasca mali VAN DUZEE, Catalog. Hemipt., 1917, p. 705.

Empoasca fabæ BALL, Jour. Econ. Entom., Vol. 17, 1924, p. 598.

Head as wide as pronotum. Vertex narrow, slightly produced, rounded or subangulate, nearly as long as pronotum. Elytra elongate, apical cells longer than broad. Last ventral segment of female

truncate. Last ventral segment of male faintly notched at tip, rounded behind, longer than preceding, plates elongate, triangular. Pygofer short, truncate, or slightly rounded behind.

Pale green in fresh specimens. A pair of divergent spots on the front border of the pronotum. These spots consist of pigments within the chitinous walls and often fade out in dried specimens. Elytra greenish hyaline, sometimes with a slight milky opacity along the costa. Length, 3 mm.

Specimens from Provincia del Sara, Bolivia (J. Steinbach), Carn. Mus. Acc. No. 5064. Chapada, Brazil (H. H. Smith). This is a very abundant species throughout a very wide range from Southern Canada to Argentina, and is the species which has been connected with the hopper-burn of potatoes. It has, therefore, great economic importance.

82. *Empoasca flavescens* (Fabricius).

Cicada flavescens FABRICIUS, Ent. Syst., IV, 1794, p. 46.

Typhlocyba flavescens Flor., Rhyn. Livl., II, 1861, p. 394.

Empoasca flavescens GILLETTE, Proc. U. S. Natl. Mus., XX., 1898, p. 745.

Empoasca flavescens VAN DUZEE, Catalogue of Hemiptera, 1917, p. 706.

Very similar to *fabæ*, usually somewhat more yellowish in color. Head broad, as wide as pronotum. Vertex long, wider than long, subangulate, one-third longer at middle than next the eye, nearly as long as pronotum. Elytra narrow, elongate. Last ventral segment of female truncate. Plates of male elongate, triangular, upcurved at tip and bending bluntly. Pygofer produced, forming a rather distinct angular projection behind.

Pale yellowish or greenish yellow. Vertex without distinct markings. Pronotum with three small spots on the anterior border, or with no evident markings, especially in dried specimens. Elytra yellowish, hyaline, iridescent. Beneath yellowish; clypeus and tarsi a blue-green. Tarsal claws black; face tinged with yellow or light orange. Length, 3 mm.

Specimens referred to this species from Puerto Suarez, Bolivia, 150 M. (J. Steinbach coll.) Carn. Mus. Acc. No. 3839, and Provincia del Sara, Bolivia (Steinbach coll.) Carn. Mus. Acc. No. 5064.

83. *Empoasca olivatula*, n. sp.

Head broad, wider than pronotum, subangulate. Vertex somewhat produced, about one-third longer at middle than next the eye. Pronotum one-half longer than vertex, truncate behind. Elytra narrow, apex evenly rounded. Last ventral segment of male one-half longer than preceding, hind border uniformly rounded; plates triangular, narrowed behind to acute upturned tips.

Bluish green. Vertex, pronotum, scutellum, and elytra, suffused with olive. Abdomen above yellowish at base, greenish at tip. Beneath bluish green; abdomen tinged with yellowish; face dull olive brown. Elytra with a white waxy patch on costa. Length, 3 mm.

One specimen, male (holotype) Chapada, Brazil, Carn. Mus. Acc. No. 2966 (H. H. Smith *coll.*). This species appears to be nearly related to *fabæ*, but the shape of the last ventral segment and the genitalia are different, and the olive suffusion has not been noted in typical *E. fabæ*.

Genus ERYTHRONEURA Fitch.

Erythroneura FITCH, Homoptera New York State Cabinet, 1851, p. 62.

84. *Erythroneura carneola*, n. sp. (Pl. XVI, figs. 58, 58a).

Robust. Head wider than pronotum; eyes large; vertex obtusely angulate, a little longer at middle than next the eye. Pronotum one-third longer than vertex, hind border slightly concave. Elytral borders nearly parallel. Venation indistinct. Last ventral segment of male as long as preceding; plates elongate, triangular, tapering uniformly to acute, upturned, sparsely ciliated tips, reaching tip of pygofer.

Dull white, anterior part of pronotum, the scutellum, and most of the elytra, reddish. A large spot at base of clavus, the outer half of clavus, and the apical area, whitish hyaline. Beneath, face, legs, last ventral segment, and base of plates, ivory-white. Abdomen above, basal segments, and tip of plates, blackish. Length, 2.75 mm.

One male (holotype) Provincia del Sara, Bolivia (Steinbach *coll.*) Carn. Mus. Acc. No. 5064.

85. *Erythroneura tropicalis*, n. sp. (Pl. XVI, figs. 55, 55a, 55b).

Head wider than pronotum, angulate, vertex half longer at middle than at eye. Pronotum little longer than vertex, concave behind; scutellum large. Last ventral segment of female narrow, produced into a long acute tip, extending upon base of ovipositor. Valve of male broad, slightly rounded behind; plates narrow, elongate, triangular, apparently fused at base, tapering to slender bluntly pointed upturned tips, extending beyond tip of pygofer.

Ivory-white. Anterior border of pronotum and scutellum bright red; elytra with numerous large reddish, or dark fulvous, patches, three on clavus, about six on corium, and a band across the apical areoles. Beneath ivory-white; tergum and venter blackish, with margins of segments white. Length, 3 mm.

One female (holotype) three males (allotype and paratypes) Provincia del Sara, Bolivia, Carn. Mus. Acc. No. 5064.

86. **Erythroneura similis**, n. sp. (Pl. XVI, figs. 60, 60a).

Broad, robust, head scarcely wider than pronotum. Eyes large. Vertex subangulate, slightly longer at middle than next the eye. Pronotum one-third longer than vertex, hind border slightly concave. Last ventral segment of male short, scarcely as long as preceding; plates broad, triangular, tips acute, reaching tip of pygofer.

A distinct band on anterior part of vertex and across base of front, the front border of pronotum, the scutellum, and eight spots on the elytra, orange-red. Elytra whitish hyaline. Abdomen dusky on tergum and basal segments. Face, except the transverse band, feet, last ventral segment and the plates, ivory-white. Length, 3 mm.

One male (holotype) Provincia del Sara, Bolivia (Steinbach) Carn. Mus. Acc. No. 5064. This is strikingly like *E. carneola*, but differs in the orange-red bands of the head and the white male plates, which also are shorter than in that species. The elytral markings resemble those of *E. tropicalis*.

This and the two preceding species *E. carneola* and *E. tropicalis*, have the general fascies of *Alebra* or *Protalebra*; but in the specimens at hand I have not been able to detect any trace of an appendix, or of ocelli.

87. **Erythroneura sublunata**, n. sp. (Pl. XVI, figs. 57, 57a).

Head as wide as pronotum, vertex produced, obtusely angulate, one-third longer at middle than next eye. Pronotum scarcely longer than vertex, truncate behind. Last ventral segment of female as long as preceding, slightly sinuate, with a faint median lobe.

Ivory-white. A large black spot at tip of vertex; pronotum except hind border, base of elytra, and a band across tip of clavus, light red; a white sublunate spot behind the middle of clavus, margined in front by a fuscous line, broken behind the costal plaque and widening on costa. Apical cells and wings smoky. Beneath ivory-white; hind tarsi tipped with dusky; abdomen dusky. Length, 2.25 mm.

One female specimen (holotype) Ft. Principe, Rio Guaporé, Brazil, Aug. 26, 1909 (Haseman coll.) Carn. Mus. Acc. No. 4043. A handsome species, particularly marked by the black spot at tip of vertex and the sublunate ivory-white spot across the clavus.

88. **Erythroneura elegantula**, n. sp.

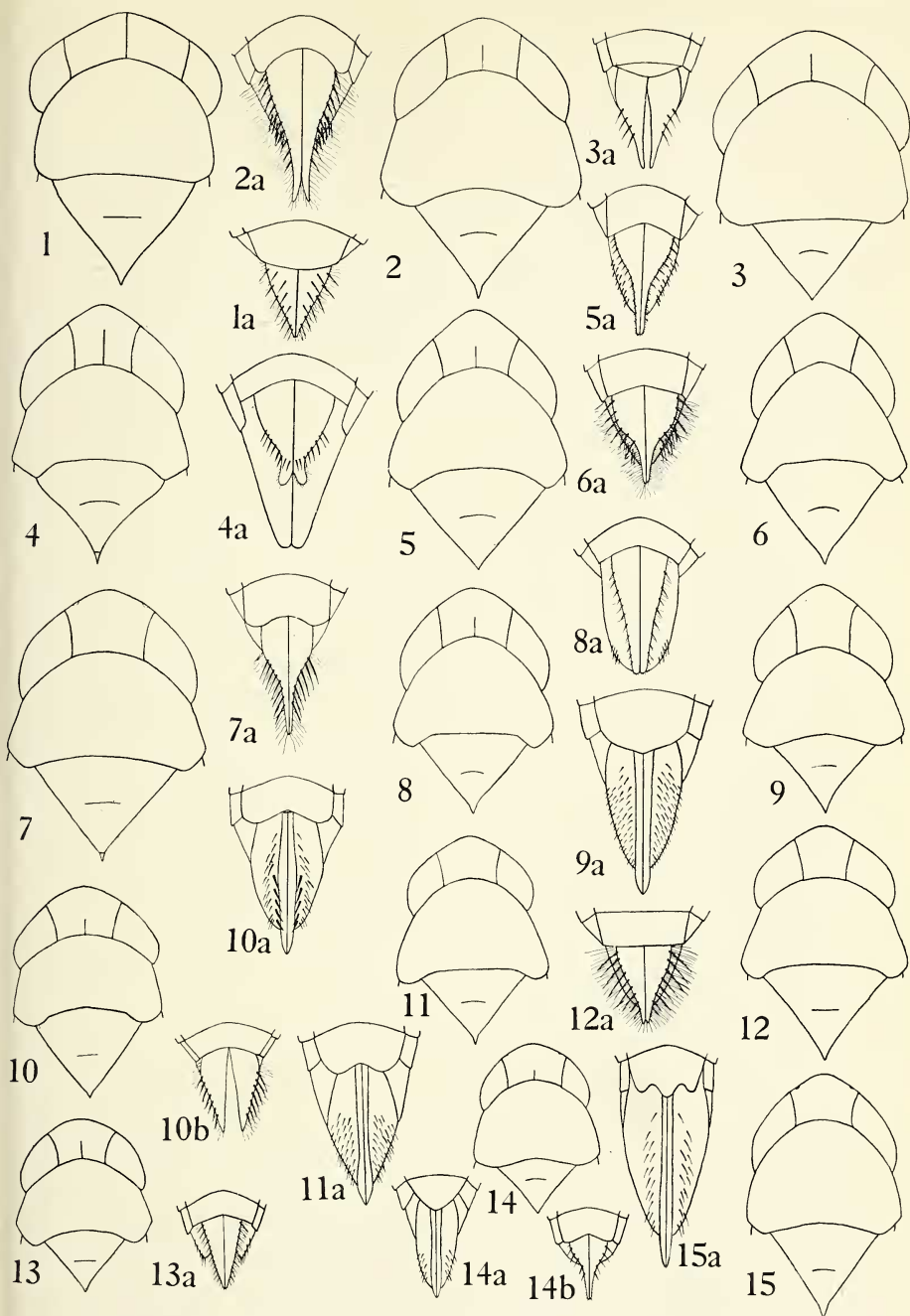
Head scarcely as wide as pronotum, angulate, vertex nearly twice as long at middle as next the eye. Pronotum slightly longer than vertex. Last ventral segment of female rounded behind. Last ventral segment of male a little longer than preceding, valve large, rounded behind; plates triangular with strongly curved acute tips.

Ivory-white. Bases of basal angles of scutellum, a large spot at middle of costa, an oblong spot at base of inner apical cell, a dot at apex of outer apical cell, and tips of male plates, fuscous. A zigzag fulvous stripe from base of clavus to middle of corium. Cross-veins tinged with red. Beneath ivory-white. Length, 3 mm.

One female (holotype) and five males (allotype and paratypes) Canal Zone, Panama. In author's collection, paratype in Carnegie Museum.

EXPLANATION OF PLATE XIII.

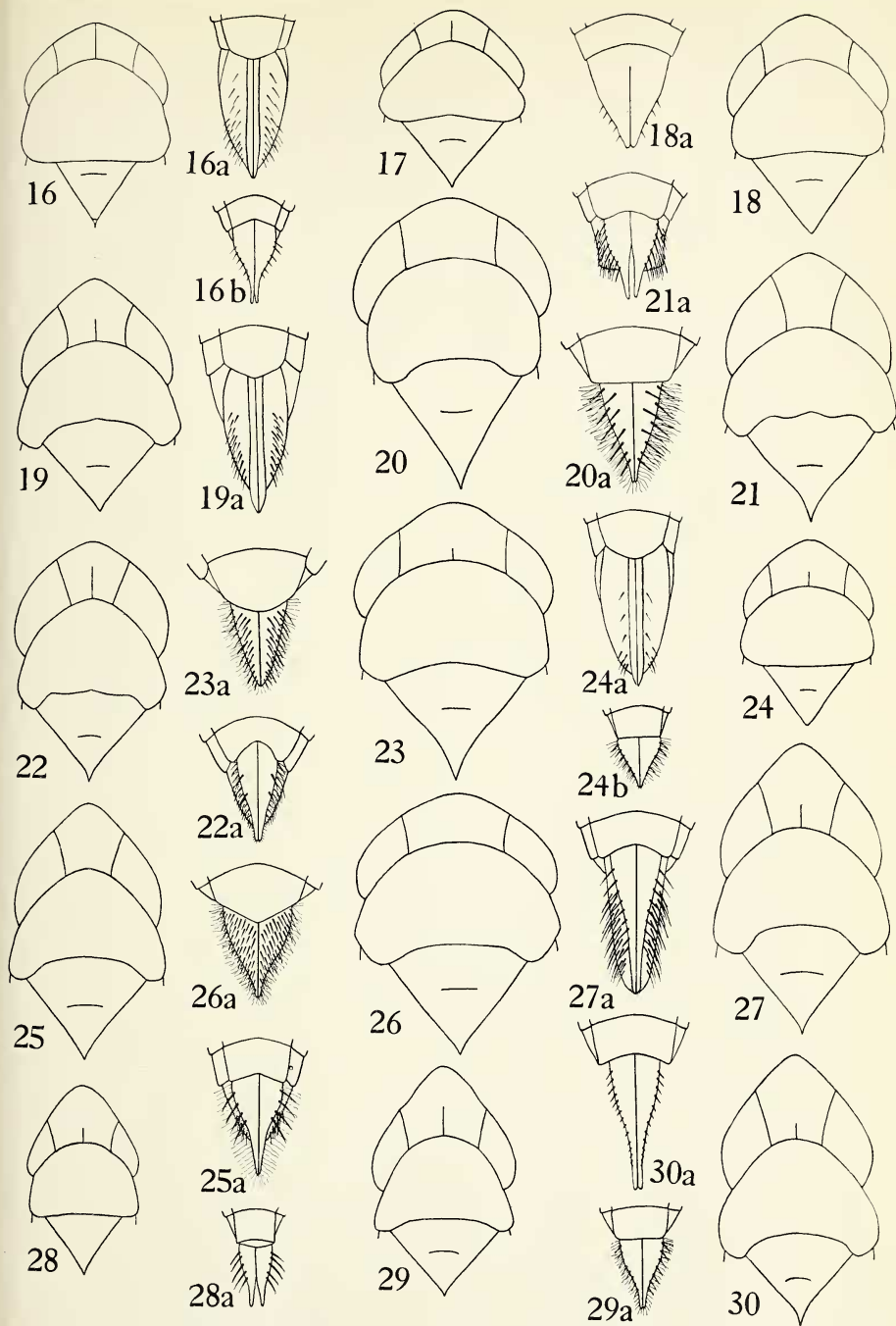
- Fig. 1. *Alebra fulvomaculata* Osborn: 1a, male genitalia.
Fig. 2. *Alebra terminalis* Osborn: 2a, male genitalia.
Fig. 3. *Protalebra fulveola* Osborn: 3a, male genitalia.
Fig. 4. *Protalebra clitellaria* Osborn: 4a, male genitalia.
Fig. 5. *Protalebra eburneola* Osborn: 5a, male genitalia.
Fig. 6. *Protalebra eburneola* Osborn: 6a, male genitalia.
Fig. 7. *Protalebra robusta* Gill: 7a, male genitalia.
Fig. 8. *Protalebra vexillifera* Baker: 8a, male genitalia.
Fig. 9. *Protalebra terminata* Baker: 9a, female genitalia.
Fig. 10. *Protalebra braziliensis* Baker: 10a, female; 10b, male genitalia.
Fig. 11. *Protalebra unipuncta* Baker: 11a, female genitalia.
Fig. 12. *Protalebra terminata* Baker: 12a, male genitalia.
Fig. 13. *Protalebra braziliensis* Baker: 13a, male genitalia.
Fig. 14. *Protalebra maculata* Baker: 14a, female; 14b, male genitalia.
Fig. 15. *Protalebra picea* Osborn: 15a, female genitalia.



Neotropical Typhlocybinae. (See opposite page).

EXPLANATION OF PLATE XIV.

- Fig. 16. *Parallaxis vacillans* McAtee: 16a, female; 16b, male genitalia.
Fig. 17. *Parallaxis ornata* Osborn.
Fig. 18. *Parallaxis rufula* Osborn: 18a, male genitalia.
Fig. 19. *Dikraneura parana* Osborn: 19a, female genitalia.
Fig. 20. *Dikraneura oculatea* Osborn: 20a, male genitalia.
Fig. 21. *Dikraneura 4-fasciata* Osborn: 21a, male genitalia.
Fig. 22. *Dikraneura sarana* Osborn: 22a, male genitalia.
Fig. 23. *Dikraneura alebroidea* Osborn: 23a, male genitalia.
Fig. 24. *Dikraneura affinis* Osborn: 24a, female; 24b, male genitalia.
Fig. 25. *Dikraneura parallella* Osborn: 25a, male genitalia.
Fig. 26. *Dikraneura breviceps* Osborn: 26a, male genitalia.
Fig. 27. *Dikraneura albidula* Osborn: 27a, male genitalia.
Fig. 28. *Dikraneura obliquata* Osborn: 28a, male genitalia.
Fig. 29. *Dikraneura maculosa* Osborn: 29a, male genitalia.
Fig. 30. *Dikraneura attenuata* Osborn: 30a, male genitalia.



Neotropical Typhlocybinae. (See opposite page).

